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**ASSIGNMENT BOOKLET**
SCN3240 Chemistry 30
Module 6 Assignment

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|---|---|
| Date Assignment Submitted: _____ | (If label is missing or incorrect) Student File Number: _____ |
| Time Spent on Assignment: _____ | Module Number: _____ |

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Assigned Teacher: _____

Assignment Grading: _____

Graded by: _____

Date Assignment Received:

**Student's Questions and Comments**

**Apply Module Label Here**

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**Postal Code**

*Please verify that preprinted label is for correct course and module.*

**Teacher's Comments**

_____
**Teacher**

# INSTRUCTIONS FOR SUBMITTING THIS DISTRIBUTED LEARNING ASSIGNMENT BOOKLET

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- Are all the assignments completed? If not, explain why.
- Has your work been reread to ensure accuracy in spelling and details?
- Is the booklet cover filled out and the correct module label attached?

## MAILING

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2. Put your Assignment Booklet in an envelope and take it to the post office and have it weighed. Attach **sufficient postage** and seal the envelope.

## FAXING

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2. All faxing costs are the responsibility of the sender.

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# Chemistry 30

Learn = veryWare

we explore

## Petrochemicals

## Module 6

## Assignment Booklet

Red Deer Catholic Regional Schools

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Calgary Board of Education

Alberta Education

## FOR TEACHER'S USE ONLY

### Summary

| | Total Possible Marks | Your Mark |
|---|---|---|
| Lesson 1 Assignment | | |
| Lesson 3 Assignment | | |
| Lesson 4 Assignment | | |
| Lesson 6 Assignment | | |
| | | |

### Teacher's Comments

Chemistry 30 Learn EveryWare
Module 6: Petrochemicals
Assignment Booklet
ISBN 978-0-7741-3182-7

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| This document is intended for | |
|---|---|
| Students | ✓ |
| Teachers | ✓ |
| Administrators | |
| Home Instructors | |
| General Public | |
| Other | |

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Read all parts of each assignment carefully, and record your answers in the appropriate places. If you have difficulty with an assignment, review the relevant sections of the lesson and the textbook. Be sure to proofread your answers carefully before submitting your Assignment Booklet.

# MODULE 6: LESSON 1 ASSIGNMENT

## Lesson 1 Assignment: Petrochemicals in Alberta

Complete the following steps:

**Step 1:** Go to the chemical formulas printed on the last two pages of this document. The formulas are for the petrochemicals shown in "Figure 2" on page 413 of the textbook.

**Step 2:** Use scissors to separate the structural diagrams for each of the petrochemical compounds.

**Step 3:** Examine the structural formula for each of the compounds.

**Step 4:** Organize the compounds into groups based on similarities in their structures.

**Step 5:** On separate pieces of paper, write a heading for each of the groupings and a brief sentence to explain why you grouped each set of compounds the way you did.

**Step 6:** Use a camera to photograph how the molecules have been grouped. Paste your photos into this Assignment Booklet. If you do not have a digital camera, show your work using diagrams drawn either digitally or by hand, or by using the petrochemical names instead of diagrams.

Keep the diagrams you cut out. You will use them throughout this module.

# MODULE 6: LESSON 3 ASSIGNMENT

## Lesson 3 Assignment: Alcohols

### Part 1

1. Complete "Lab Exercise 10.A—Synthesis of an Organic Halide" on page 423 of the textbook. Include the names of all chemical substances shown in the reactions. Ensure all equations are balanced.

2. Write chemical reactions describing two different processes that could be used to produce ethanol. Include the names of all chemical substances shown in the reactions. Ensure all equations are balanced.

3. In Lesson 1 you organized cards containing chemical structures for a number of petrochemical compounds. Retrieve your cards. Identify which cards contain organic halides and which cards contain alcohols. Complete the table below for the compounds you identify. Use only the rows you need.

| Grouping | Name of Molecule on Card | IUPAC Name |
|---|---|---|
| Organic Halides | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| Alcohols | | |
| | | |
| | | |
| | | |
| | | |
| | | |

## Part 2

1. Complete the table below. Write a paragraph to summarize the information presented, making sure to identify the different perspectives.

| Information About Biofuel Production | Perspective |
|---|---|
| | |

2. After reading the information available to you, would you be able to make a decision about the production and use of biofuels? Write a paragraph to identify your reasons for your ability or inability to make a decision on this topic.

# MODULE 6: LESSON 4 ASSIGNMENT

## Lesson 4 Lab: Synthesizing Esters

### Pre-Lab

Obtain a copy of the handout "Making Esters." Study the table to see which scents are produced from the reaction of the carboxylic acid and the alcohol.

Use this list (or another one provided by your teacher that lists the alcohols and carboxylic acids available to you in your school) and the table below to complete question 1.

| Reaction | Alcohol | Carboxylic Acid |
|---|---|---|
| 1 | ethanol | ethanoic acid |
| 2 | methanol | salicylic acid |

1. Use structural formulas to write balanced chemical equations for reactions to synthesize three esters using the alcohols and carboxylic acids available to you.

   If you are viewing the video presentation, use the information in the table above to complete your first two reactions. For all reactions, write the predicted evidence for the reactions you have written.

### Analysis

1. Compare the observed odours with the scents listed in the "Making Esters" handout. Were you able to create the ester you intended to synthesize? Use the evidence from the experiment to support your answer.

2. Compare your results with those of other students in your class. Were some esters more difficult to make than others?

3. Is the creation of an ester a fast or a slow reaction? Give a reason for your answer.

4. Is this method to create esters reliable and valid?

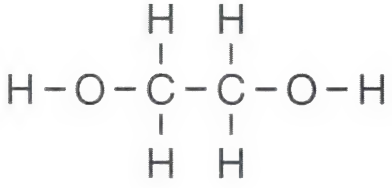
## MODULE 6: LESSON 6 ASSIGNMENT

You have learned about the following types of chemical reactions that involve organic molecules:

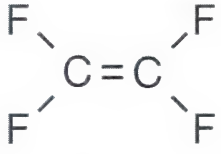
- addition
- combustion
- elimination
- esterification
- substitution

Answer the following questions for **each** of the following organic molecules, numbered 1–5:

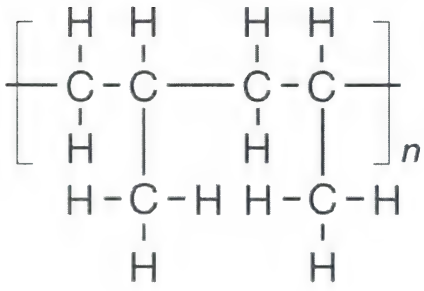
Molecule 1



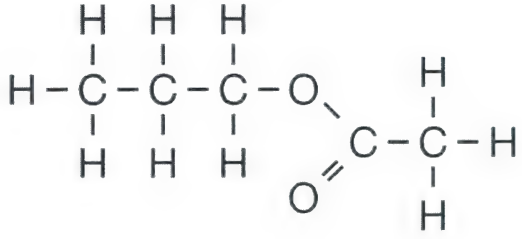
Molecule 2



Molecule 3



Molecule 4

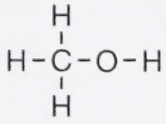
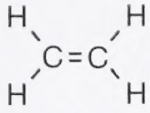
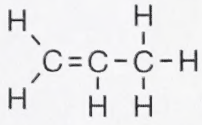
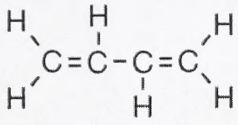
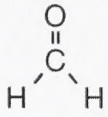
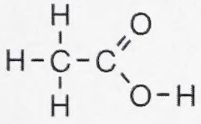
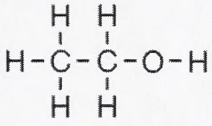
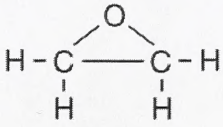
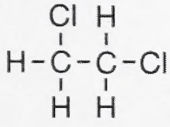
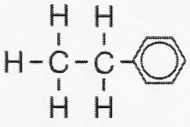
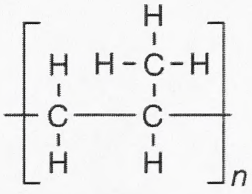
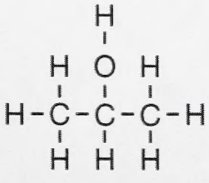
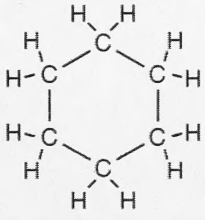
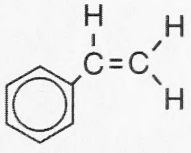


Molecule 5

1. Identify a reaction type that could be used to **produce** each molecule.

2. Write the balanced chemical equation for the production of each molecule using the reaction type identified in question 1.

3. Below each of your equations in question 2, write the name of the reactants and products developed in your answer to question 2.

| | | |
|---|---|---|
|  Methanol |  Ethylene | Benzene |
|  Propylene |  Butadiene |  Formaldehyde |
|  Acetic Acid |  Ethanol |  Ethylene oxide |
|  Ethylene dichloride |  Ethyl benzene |  Polypropelene |
|  Isopropanol |  Cyclohexane |  Styrene |

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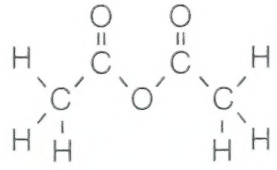
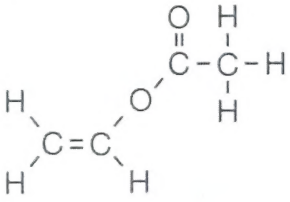
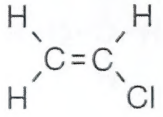
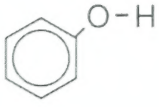
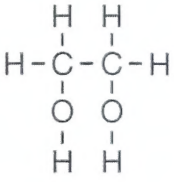
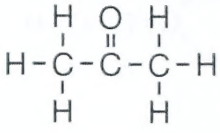
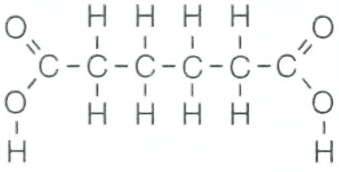
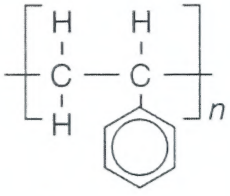
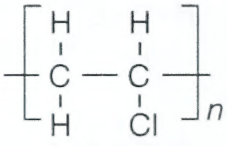
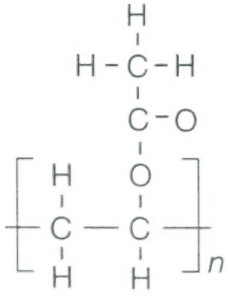
|  Acetic anhydride |  Vinyl acetate |  Vinyl chloride |
|  Phenol |  Ethylene glycol |  Acetone |
|  Adipic Acid |  Polystyrene |  Polyvinyl chloride |
|  Polyvinyl acetate | | |

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